

CLAIMS

I/We claim:

[c1] 1. A cab portion for an aircraft, comprising:
an external flow surface having a generally rounded nose portion with a forward extremity, the external flow surface further having a windshield aperture positioned only above and aft of the forward extremity of the rounded nose portion; and
a windshield disposed in the windshield aperture, wherein a contour of the external flow surface and the windshield extending from a position on the external flow surface beneath the windshield, aft over the windshield to a position on the external flow surface aft of and above the windshield has a generally continuously smooth, unkinked shape.

[c2] 2. The cab portion of claim 1 wherein the contour of the external flow surface and the windshield intersects a generally vertical plane passing through the external flow surface and the windshield.

[c3] 3. The cab portion of claim 1 wherein the contour of the external flow surface and the windshield intersects a generally vertical plane passing through the external flow surface and the windshield, and wherein a portion of the contour corresponding to the windshield is convex when viewed from a position external to the external flow surface.

[c4] 4. The cab portion of claim 1 wherein the contour of the external flow surface and the windshield intersects a generally vertical plane passing through the external flow surface and the windshield at a longitudinal centerline of the cab portion.

[c5] 5. The cab portion of claim 1 wherein the contour of the external flow surface and the windshield is a first contour intersecting a generally vertical plane passing through the external flow surface and the windshield at a longitudinal centerline of the cab portion, and wherein a second contour of the external flow surface and the windshield intersecting a generally horizontal plane passing through the external flow surface and the windshield and extending aft over the windshield to a position on the external flow surface aft of the windshield has a generally continuously smooth, unkinked shape.

[c6] 6. The cab portion of claim 1 wherein the windshield has a generally conical shape.

[c7] 7. The cab portion of claim 1 wherein an external surface of the windshield forms a portion of a conical surface.

[c8] 8. The cab portion of claim 1 wherein the contour is defined by an intersection between:
a plane oriented at one of any angle from vertical to horizontal; and
both the external flow surface and the windshield.

[c9] 9. The cab portion of claim 1, further comprising a radar positioned within the external flow surface.

[c10] 10. The cab portion of claim 1 wherein the external flow surface is shaped for cruise flight at a subsonic Mach number of at least 0.85.

[c11] 11. The cab portion of claim 1 wherein the external flow surface is shaped for cruise flight at a subsonic Mach number of from about 0.85 to about 0.98.

[c12] 12. The cab portion of claim 1 wherein the windshield includes a single panel extending across a generally vertical plane passing through a longitudinal centerline of the external flow surface.

[c13] 13. The cab portion of claim 1 wherein the windshield includes a plurality of panels extending aft from a generally vertical plane passing through a longitudinal centerline of the external flow surface.

[c14] 14. The cab portion of claim 1 wherein the contour is generally smooth, continuous and unkinked at a first joint between a lower edge of the windshield and the external flow surface, and at a second joint between an upper edge of the windshield and the external flow surface.

[c15] 15. The cab portion of claim 1, further comprising a crew station disposed within the external flow surface, the crew station including aircraft controls.

[c16] 16. An aircraft, comprising:
a wing portion;
a fuselage portion coupled to the wing portion, the fuselage portion including a cab portion, the cab portion including:
an external flow surface having a generally rounded nose portion with a forward extremity, the external flow surface further having a windshield aperture positioned only above and aft of the forward extremity of the rounded nose portion; and
a windshield disposed in the windshield aperture, wherein a contour of the external flow surface and the windshield extending from a position on the external flow surface beneath the windshield, aft over the windshield to a position on the external flow surface aft of and above the windshield has a generally continuously smooth, unkinked shape;

landing gear depending from at least one of the wing portion and the fuselage portion; and
a propulsion system.

[c17] 17. The aircraft of claim 16 wherein the propulsion system includes at least one turbofan engine.

[c18] 18. The aircraft of claim 16 wherein the fuselage portion has a waisted cross-sectional shape including a first region having a first cross-sectional area, a second region aft of the first region having a second cross-sectional area smaller than the first cross-sectional area, and a third region aft of the second region having a third cross-sectional area greater than the second cross-sectional area.

[c19] 19. The aircraft of claim 16, further comprising a canard depending from the fuselage portion.

[c20] 20. The aircraft of claim 16 wherein the wing portion, the fuselage portion and the propulsion system are shaped and configured for cruise flight at a subsonic Mach number of at least 0.85.

[c21] 21. The aircraft of claim 16 wherein the fuselage portion houses a pressurized passenger cabin.

[c22] 22. A cab portion for an aircraft, comprising:
an external flow surface having a generally rounded nose portion with a forward extremity, the external flow surface further having a windshield aperture positioned only above and aft of the forward extremity of the rounded nose portion, the external flow surface being shaped for cruise flight at a subsonic Mach number of at least 0.85; and

a windshield disposed in the windshield aperture, wherein a first contour of the external flow surface and the windshield intersecting a generally vertical plane passing through the external flow surface and the windshield extends from a position on the external flow surface beneath the windshield, aft over the windshield to a position on the external flow surface aft of and above the windshield and has a generally continuously smooth, unkinked shape, and wherein a second contour of the external flow surface and the windshield intersecting a generally horizontal plane passing through the external flow surface and the windshield extends aft over the windshield to a position on the external surface aft of the windshield and has a generally continuously smooth, unkinked shape.

- [c23] 23. The cab portion of claim 22 wherein a portion of the first contour corresponding to the windshield is convex when viewed from a position external to the external flow surface.
- [c24] 24. The cab portion of claim 22 wherein an external surface of the windshield forms a portion of a conical surface.
- [c25] 25. The cab portion of claim 22 wherein the first contour is generally smooth, continuous and unkinked at a first joint between a lower edge of the windshield and the external surface, and at a second joint between an upper edge of the windshield and the external surface.
- [c26] 26. The cab portion of claim 22, further comprising a crew station disposed within the external flow surface, the crew station including aircraft controls.

[c27] 27. A method for manufacturing an aircraft system, comprising: fabricating an external flow surface having a generally rounded nose portion with a forward extremity and a windshield aperture positioned above and aft of the forward extremity of the rounded nose portion; and positioning a windshield in the windshield aperture, with a contour of the external flow surface and the windshield extending from a position on the external flow surface beneath the windshield, aft over the windshield to a position on the external flow surface aft of and above the windshield having a generally continuously smooth and unkinked shape.

[c28] 28. The method of claim 27 wherein positioning the windshield includes positioning the windshield so that the contour of the external flow surface and the windshield intersects a generally vertical plane passing through the external flow surface and the windshield.

[c29] 29. The method of claim 27 wherein positioning the windshield includes positioning the windshield so that the contour of the external flow surface and the windshield intersects a generally vertical plane passing through the external flow surface and the windshield at a longitudinal centerline of the cab portion.

[c30] 30. The method of claim 27 wherein the contour of the external flow surface and the windshield is a first contour and wherein positioning the windshield includes positioning the windshield so that the first contour intersects a generally vertical plane passing through the external flow surface and the windshield at a longitudinal centerline of the cab portion, and wherein positioning the windshield includes positioning the windshield so that a second contour of the external flow surface and the windshield intersecting a generally horizontal plane passing through the external flow surface and the windshield and extending aft over the windshield to a position on the external flow surface aft of the windshield has a generally continuously smooth, unkinked shape.

[c31] 31. The method of claim 27 wherein positioning a windshield includes positioning a windshield having an external surface that forms a portion of a conical surface.

[c32] 32. The method of claim 27 wherein positioning the windshield includes positioning the windshield so that the contour is defined by an intersection between:
a plane oriented at one of any angle from vertical to horizontal; and
both the external flow surface and the windshield.

[c33] 33. The method of claim 27, further comprising disposing a radar within the external flow surface.

[c34] 34. The method of claim 27, further comprising shaping the external flow surface for cruise flight at a subsonic Mach number of at least 0.85.

[c35] 35. The method of claim 27, further comprising shaping the external flow surface for cruise flight at a subsonic Mach number of from about 0.85 to about 0.98.

[c36] 36. The method of claim 27 wherein positioning the windshield includes positioning a single panel extending across a generally vertical plane passing through a longitudinal centerline of the external flow surface.

[c37] 37. The method of claim 27 wherein positioning the windshield includes a positioning a plurality of panels extending aft from a generally vertical plane passing through a longitudinal centerline of the external flow surface.

[c38] 38. The method of claim 27 wherein positioning the windshield includes positioning the windshield so that the contour is generally smooth, continuous and unkinked at a first joint between a lower edge of the windshield and the external

surface, and at a second joint between an upper edge of the windshield and the external surface.

[c39] 39. The method of claim 27, further comprising disposing a crew station within the external flow surface, the crew station including aircraft controls.

[c40] 40. The method of claim 27 wherein the external flow surface includes an external flow surface of an aircraft cab portion, and wherein the method further comprises:

coupling the cab portion to a fuselage portion housing a passenger cabin;

coupling a wing portion to at least one of the fuselage portion and the cab portion; and

coupling a propulsion system to at least one of the wing portion and the fuselage portion.